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ABSTRACT

This study examined whether expert-novice differences exist in the ability to engage in self-analysis, a form of reflection about one's own teaching performance. Expert (N=6) and novice (N=5) sixth-grade teachers were videotaped while teaching and were interviewed after viewing their own lessons. Expert teachers, in comparison to novices, commented more about the underlying characteristics of the lesson rather than just its surface features, and they mentioned principles of instruction more frequently. Experts appeared to have more and richer schemata to call upon when engaging in reflection about their own teaching. Reflective, critical, self-analyatic thought may be difficult for those without much experience. (Author/IAH)

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Schema Differences Among Expert and Novice Teachers in Reflection About Teaching

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Abstract

This study examined whether expert-novice differences exist in the ability to engage in self-analysis, a form of reflection about ones own teaching performance. Expert (n=6) and novice (n=5) sixth grade teachers were video-taped while teaching and interviewed after viewing their own lessons. Expert teachers, in comparison to novices, commented more about the underlying characteristics of the lesson, rather than merely the surface features of the lesson, and they more frequently mentioned principles of instruction. Experts appeared to have more and richer schemata to call upon when engaging in reflection about their own teaching. Reflective, critical, self-analytic thought may be difficult for those without much experience.

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Cognitive psychologists have described the storage of knowledge in memory as a "schema" (Anderson, 1977). Schemata are cognitive structures that represent organized knowledge about a given concept, event, or stimulus situation. Schemata contain both the attributes of a concept or an event and the relationships among the attributes. Schema serve to organize incoming information thematically. The existing knowledge encompassed by the schema allows interpretation of current events and prediction in new situations. Schemata, then serve as theories, frames, or scripts that guide how people take in, remember, and make inferences about raw data. Clark and Peterson (1986) hypothesized that experienced teachers have better developed knowledge structures or schema for phenomena related to classroom teaching and learning than do novice teachers. Experts also tend to be more selective in their use of information during planning and interactive teaching, and have greater knowledge of instructional and management routines (Livingston and Borko, 1989; Leinhart and Greeno, 1986; Berliner 1987;1988). Furthermore, in other studies of expertise, expert computer programmers were found to use different kinds of information when debugging their own programs than did novice

computer programmers (Vessey, 1985). The experts, apparently, invoked different schema than did the novices. These two lines of research suggest that expert teachers, in comparison to novices, are likely to use rather different schema when evaluating their own teaching performance. Because many contemporary teacher education programs are concerned about reflection and self analysis skills, it is important to inquire whether experts and novices differ in their ability to engage in reflection, evaluation, and self analysis. Thus, this study was designed to inquire whether experts and novices differed substantially in such abilities.

Method

Principals in school districts in the Phoenix, Arizona metropolitan area were asked to nominate 2-3 expert teachers and 2-3 novice teachers in their schools. Nominated subjects were contacted and visited in their classrooms where the study was explained to them. A volunteer sample of 6th grade teachers was assembled consisting of 6 experts (5 females, 1 male) and 5 novices (3 females, 2 male). Expert teachers ranged in years of experience from 10 to 25 years. Novice teachers were first or second year teachers. The final sample chosen come from three districts and seven different schools.

Design of the study required that each teacher develop and teach a 15-minute lesson in social studies. No restrictions were placed on the subject matter to be taught. The lessons were videotaped and a semi-structured interview was conducted with each teacher following the lesson. The focus of the interview was the teachers' reflections about the lesson. Questions asked each

teacher were about their lesson planning, goals, methods of improvement, evaluation of the lesson, and the content they chose. This interview was audiotaped and transcribed. The coding of the protocols, along with the videotaped lesson and copies of the planning documents (written plans and content notes) that were used by the teachers constituted the data set used in this study.

Results

The analysis of the data obtained in this study supported the hypothesis that expert teachers have better developed schema for classroom events than do novice teachers. During and after viewing their videotaped lessons, in comparison to novice teachers, expert teachers recalled more classroom events and commented more about underlying classroom events. They also relied more on procedural knowledge and instructional principles when analyzing their performance. These findings are similar to those found in the comparisons between master and novice chess players. That research demonstrated that master chess players recall significantly more chess problems then do novice players (deGroot, 1966; Chase and Simon, 1973). This suggests that experts have richer, more extensively developed schema than do novices.

Results also demonstrated that experts had much less detailed notes for planning than did the novice teachers. On the other hand, when questioned about their planning, the experts described extensive mental plans. Experts also reported planning they did outside the formal classroom planning times. In the interview the experts frequently reported on the general sequence of the lesson components and commented also about the content they taught.

Unlike novice teachers, they did not discuss certain details of the lesson such as the timing and pacing of instruction. Novice teachers reflections were, in general, less focused but addressed a greater variety of concerns. They all commented on aspects of their own teaching effectiveness such as clarity, use of the chalkboard, etc.

Both expert and novice teachers made reference to student understanding of the material. In fact, the one common theme in the reflections of experts and novices was attention to student participation.

Discussion

The analysis and reflective thinking of experts can be described as a process of combining information from existing schemata to fit the given lesson. This appeared to be a "top-down" process. Novices more frequently displayed "bottom-up" processes, revealing a less well developed schemata.

The more developed schemata shown for classroom events among the experts suggest that reflection by them is likely to be more profitable than with novices. It may be difficult for inexperienced teachers to profit greatly from reflection, evaluation, and self analysis of their own skills. As in other areas of expertise, thousands of hours may need to be spent in building up procedural and case knowledge before the frameworks for viewing oneself and reflecting upon ones practice are in place.

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